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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/762,519	02/07/2001	Toshikazu Tomioka	10059-372US	4800

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AKIN GUMP STRAUSS HAUER & FELD L.L.P.
ONE COMMERCE SQUARE
2005 MARKET STREET, SUITE 2200
PHILADELPHIA, PA 19103-7013

EXAMINER

MUTSCHLER, BRIAN L

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 04/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/762,519

Applicant(s)

TOMIOKA ET AL.

Examiner

Brian L. Mutschler

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 9-11, 13 and 15-17 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 9-11, 13 and 15-17 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Comments

1. Applicant's cancellation of claims 1-7, 12, and 14 in the response submitted February 2, 2004, which was supplemented by a response filed March 4, 2004, is acknowledged.
2. The objection to minor informalities in the specification has been overcome by Applicant's amendment to the specification.
3. The objection to the abstract for being too long has been overcome by Applicant's submission of a replacement abstract.
4. The objections to claims 12 and 14 have been overcome by Applicant's cancellation of the claims.
5. The rejection of claims 8-14 under 35 U.S.C. 112, second paragraph, has been overcome by Applicant's amendment to the claims.

Specification

6. The replacement Table I submitted with the response of February 2, 2004, includes the correct arrow notation, but the remaining cells of the table now appear as rectangles. Please submit a new copy of Table I that properly shows the content of each cell.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

8. Claims 11, 13, 16, and 17 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 11 recites the limitations "the electrode having a higher oxidation/reduction potential relative to the remaining at least two electrodes" and "the electrode having a lower oxidation/reduction potential relative to the remaining at least two electrodes" in lines 3-4 and lines 5-6, respectively. This limitation is indefinite because it appears that three electrodes are present, and only two electrodes are positively recited in the independent claim. There is antecedent basis for "at least two electrodes," but there is no antecedent basis for "the electrode" in addition to the "at least two electrodes." Similar limitations also appear in claims 16 and 17.

Claim 13 recites the preamble "The electrochemical device in accordance with claim 12." Since claim 12 has been cancelled, claim 13 is now indefinite because it depends on a cancelled claim.

Claim 13 recites the limitation "said structure" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 9, 11, and 15-17 are rejected under 35 U.S.C. 102(e) as being anticipated by Muroki (U.S. Pat. No. 5,944,685).

Regarding claim 15, Muroki teaches an electrochemical device for moving charged particles by electrophoresis comprising two electrodes (2 (copper), 4 (zinc)) having different oxidation/reduction potentials and a circuit (conductive sheets) (5, 5') that short-circuit the electrodes (figs. 1A and 1B; abstract; col. 5, line 7 to col. 6, line 53). The particles would move in a direction aligned perpendicular to the surface of the electrodes (2, 4).

Regarding claim 9, since the device of Muroki is designed for moving particles electrophoretically, it would be capable of moving particles covered with protein, which contain charged groups.

Regarding claim 10, both electrodes (2, 4) in the device of Muroki are capable of permitting fluid to flow through. One electrode (4) has a grid structure and the other electrode (2) can be a meshed metal film or a metal film with perforated patterns (figs. 1A and 1B; col. 5, lines 7-35). Therefore, the device has introduction/discharge portions at either side.

Regarding claim 11, the device has a non-conductive pad layer (**42**) disposed between the electrodes (**2, 4**) (fig. 1B; col. 5, lines 7-41). The non-conductive pad (**42**) has a grid structure that would allow liquid to pass through (fig. 1B).

Regarding claim 16, both electrodes of the device have electrodes (**2, 4**) that are capable of allowing liquid to flow through the space (fig. 1B; col. 5, lines 28-35).

Regarding claim 17, both electrodes (**2, 4**) comprise metal films that allow material to flow through, through either perforations or by using a grid-like structure (fig. 1B; col. 5, lines 28-35; col. 6, lines 27-53).

Since Muroki teaches all of the structural limitations recited in the claims, the reference is deemed to be anticipatory.

11. Claims 9, 10, and 15 are rejected under 35 U.S.C. 102(b) as being anticipated by Anderson (U.S. Pat. No. 3,865,711).

Regarding claim 15, Anderson teaches a device for electrochemically separating components in a mixture using either galvanic or impressed direct current (col. 5, lines 27-29). Impressed direct current uses an external power source to provide a current, whereas galvanic current generates its own current based on the oxidation/reduction potentials of the electrodes. The device uses a steel tank (**10**) that acts as the cathode and iron anodes (**17, 21, 23**) dispersed throughout the tank (fig. 1). When galvanic current is used, the electrodes would be short-circuited.

Regarding claims 15 and 9, the device is capable of electrophoretically separating charged particles such as protein-covered particles.

Regarding claim 10, the device has introduction/discharge portions in the vicinity of the electrodes (fig. 1).

Since Anderson teaches all of the limitations recited in the instant claims, the reference is deemed to be anticipatory.

Response to Arguments

12. Applicant's arguments filed February 2, 2004, have been fully considered but they are not persuasive.

13. Applicant argues that Muroki does not possess each element of the invention as claimed because Muroki does not disclose a liquid containing particles covered with a protein (see page 9 of Applicant's response). This argument is not persuasive because the liquid containing particles covered with a protein does not structurally limit the claimed device. The liquid is not a part of the device. The liquid is the intended use of the device. The structure of the device does not change when different liquids are used. The device of Muroki is used to move drugs (antibiotic drugs, anti-epilepsy drugs, anti-arrhythmia drugs, hormone drugs, and insulin drugs) through the conductive matrix 3, which is made of a gel (see col. 10, lines 15-20). Gels are colloidal substances (i.e., solid support having a fluid absorbed therein) that allow the transport of charged particles. Since Muroki teaches all of the structural limitations recited in the claims and is capable of performing the intended use, the reference is deemed to be anticipatory.

14. Regarding the rejection of the claims over the reference of Anderson, Application argues, "Regardless of whether galvanic or impressed direct current are used, the

Anderson device requires that a voltage is applied externally to move components in the electrolyte" (see page 10 of Applicant's response). In response to Examiner's position that "galvanic current generates its own current based on the oxidation/reduction potentials of the electrodes," Applicant argues that "galvanic current is a direct current generated by a chemical reaction" (see page 10 of Applicant's response).

15. Regarding Applicant's second comment first, Examiner fully agrees with Applicant's statement. However, both statements are equally true. A chemical reaction is necessary to provide any current. This also raises an important issue to be addressed. The instant invention cannot work merely by short-circuiting two electrodes having different oxidation/reduction potentials. Moving particles requires more than two short-circuited electrodes contacting a liquid. A current must pass between the electrodes. This current cannot be generated by the electrodes alone. A simple example to clarify this point is demonstrated by the traditional chemistry experiment of making a battery from a potato or a lemon, where the electrodes are short-circuited by the lemon or potato and the acid reacts with the electrodes to provides electrons (see "Food Batteries" at <http://www.madsci.org/experiments/archive/889917606.Ch.html>). A chemical reaction must take place to supply the electron flow that is the driving force for the movement of the particles. The electrodes having different oxidation/reduction potentials only provide a direction through which the electrons will flow, but do not themselves provide the electrons. Therefore, the instant invention must have a source of electrons.

16. Returning to Applicant's first argument, the reference of Anderson is not irrelevant simply because it uses either a galvanic or implied direct current. Whether internally generated or applied by an external source, the device of Anderson anticipates the instant invention. In its broadest interpretation, the instant invention requires at least two electrodes having different oxidation/reduction potentials that are short-circuited by a circuit. Short-circuiting means only that a path of low resistance connects the electrode. The solution or an external source provides the short circuit in the device of Anderson. As an example, a battery connected to a copper electrode and a zinc electrode has the structural limitations recited in claim 15 of the instant invention. Since Anderson teaches the structural limitations recited in the instant claims, the reference is deemed to be anticipatory.

Conclusion

17. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

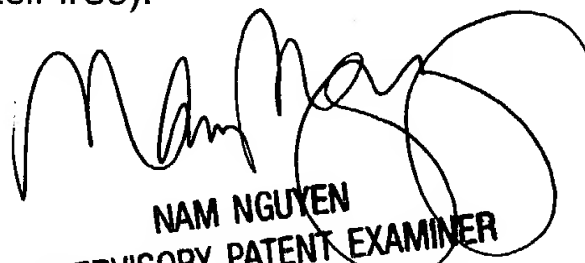
extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian L. Mutschler whose telephone number is (571) 272-1341. The examiner can normally be reached on Monday-Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

blm
April 16, 2004


NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700